

## **REMARKS**

The Office Action of February 27, 2007, has been carefully considered.

It is noted that claims 18, 20-27 and 29-37 are rejected under 35 U.S.C. 103(a) over WO 02/41423 to Friedrich.

Claims 19 and 21 are rejected under 35 U.S.C. 103(a) over Friedrich in view of the patent to Sim, et al.

Applicant respectfully submits that the claims currently on file differ essentially and in an unobvious, highly advantageous manner from the constructions disclosed in the references.

Turning now to the references, and particularly to the reference of Friedrich, it can be seen that this reference discloses an electrolyte matrix which contains lithium carbonate, aluminum oxide and zirconium carbide. Friedrich does not teach an electrolyte matrix containing titanium carbide, as in the presently claimed invention. The Examiner takes the position that it would be obvious substitute titanium for the zirconium used in Friedrich since both belong to Group 4 of the Periodic Table.

Applicant submits that this substitution is not obvious. In support of this, applicant has enclosed herewith a Declaration made by one of the inventors.

The Declaration states that the shelf life of lab electrolyte matrix green tape samples using zirconium carbide was limited to a time frame of 2-4 weeks, depending on temperature and humidity. This time frame is far too short for a commercial use of this material in Molten Carbonate Fuel Cells (MCFC). This is because the material has to be produced, dried, quality control measures have to be taken, which is all followed by the stacking of the MCFC components, where the matrix tape is built in as a green tape. Subsequently, the instrumentation of the stack using thermocouples and the assembly into the thermal installation takes place. The period of time until the conditioning procedure of the stack starts, is at least 4-6 weeks. Thus, shelf life of at least 3 months is required. Since an electrolyte matrix with zirconium carbide only has a very limited shelf life, it would not be obvious that another material belonging to the same group of the Period Table as zirconium would provide a longer shelf life. In fact, surprisingly, titanium carbide provides a shelf life of more than 6 months. Thus, since zirconium carbide only provides a very limited shelf life, those skilled in the art would not find it obvious to use other materials contained in the same Group of the Periodic Table since it would be expected that these other materials of the same Group would provide an electrolytic matrix with a shelf life similar to that of zirconium carbide. Applicant submits that if anything, Friedrich teaches away from using other elements

belonging to Group 4 of the Periodic Table since the element used in Friedrich results in an unacceptably short shelf life of the electrolyte matrix.

Furthermore, the handling properties of zirconium carbide containing samples are characterized by low and changing stability of the green tape. During the stacking procedure such a matrix tape, in a size of about 1 square meter, results in bending. Once again, one skilled in the art would expect similar bending from other elements contained in the same Periodic Group and therefore there is no suggestion for using any of these other elements, in particular titanium. The mechanical properties of samples containing titanium carbide are significantly better in terms of bending radius, brittleness and elongation at fracture.

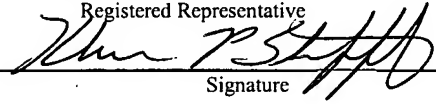
In view of these considerations it is respectfully submitted that it would not be obvious to use titanium carbide in place of the zirconium carbide taught by Friedrich. Thus, it is further respectfully submitted that the rejection of claims 18, 20-27 and 29-33 under 35 U.S.C. 103(a) over the above-discussed reference is overcome and should be withdrawn.

The patent to Sim, et al. has also been considered. Applicant submits that this reference adds nothing to the teachings of Friedrich so as to suggest the presently claimed invention as discussed above. Therefore, it is respectfully submitted that the

rejections of claims 19 and 28 under 35 U.S.C. 103(a) over a combination of the above-discussed references is overcome and should be withdrawn.

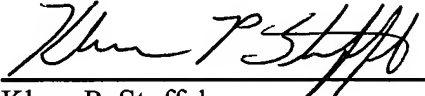
Reconsideration and allowance of the present application are respectfully requested.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on June 27, 2008

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June 27, 2008  
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